(6) ANSI/AHRI Standard 390–2003, ''2003 Standard for *Performance Rating of Single Package Vertical Air-Conditioners and Heat Pumps*,'' dated 2003, (AHRI 390–2003), IBR approved for § 431.96.

(7) ANSI/AHRI Standard 1230–2010, ''2010 Standard for *Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment*,'' approved August 2, 2010 and updated by addendum 1 in March 2011 (AHRI 1230–2010), IBR approved for § 431.96.

(8) [Reserved]

(c) *ASHRAE*. American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1791 Tullie Circle, NE., Atlanta, Georgia 30329, (404) 636–8400, or go to: *http://www.ashrae.org*.

(1) ASHRAE Standard 127–2007, ''*Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners*,'' approved on June 28, 2007, (ASHRAE 127–2007), IBR approved for § 431.96.

(2) [Reserved]

(d) *ISO*. International Organization for Standardization, 1, ch. De la Voie-Creuse, Case Postale 56, CH–1211 Geneva 20, Switzerland, +41 22 749 01 11 or go to: *http://www.iso.ch/*.

(1) ISO Standard 13256–1, ''*Water-source heat pumps—Testing and rating for performance—Part 1: Water-to-air and brine-to-air heat pumps*,'' approved 1998, IBR approved for § 431.96.

(2) [Reserved]

[77 FR 28989, May 16, 2012]

§ 431.96 Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps.

(a) *Scope*. This section contains test procedures for measuring, pursuant to EPCA, the energy efficiency of any small, large, or very large commercial package air-conditioning and heating equipment, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, variable refrigerant flow systems, and single package vertical air conditioners and single package vertical heat pumps.

(b) *Testing and calculations*. (1) Determine the energy efficiency of each covered product by conducting the test procedure(s) listed in the rightmost column of Table 1 of this section, that apply to the energy efficiency descriptor for that product, category, and cooling capacity, until compliance with this test procedure version is no longer required per the date shown in the 5th most column from the left of Table 1 of this section.

TABLE 1 TO § 431.96—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Test procedure required for compliance until	Use tests, conditions, and procedures [1] in
Small Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled, 3-Phase, AC and HP.	<65,000 Btu/h	SEER and HSPF	May 13, 2013	ARI 210/240–2003.
		≥65,000 Btu/h and <135,000 Btu/h.	EER and COP	May 13, 2013	ARI 340/360–2004.
	Air-Cooled AC and HP.				
	Water-Cooled and Evaporatively-Cooled AC.	<65,000 Btu/h	EER	May 13, 2013	ARI 210/240–2003.
		≥65,000 Btu/h and <135,000 Btu/h.	EER	May 13, 2013	ARI 340/360–2004.
	Water-Source HP	<135,000 Btu/h	EER and COP	May 13, 2013	ISO Standard 13256–1 (1998).
Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥135,000 Btu/h and <240,000 Btu/h.	EER and COP	May 13, 2013	ARI 340/360–2004.
			EER	May 13, 2013	ARI 340/360–2004.
	Water-Cooled and Evaporatively-Cooled AC.	≥135,000 Btu/h and <240,000 Btu/h.			
Very Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥240,000 Btu/h and <760,000 Btu/h.	EER and COP	May 13, 2013	ARI 340/360–2004.
			EER	May 13, 2013	ARI 340/360–2004.
	Water-Cooled and Evaporatively-Cooled AC.	≥240,000 Btu/h and <760,000 Btu/h.			

TABLE 1 TO § 431.96—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS—Continued

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Test procedure required for compliance until	Use tests, conditions, and procedures [1] in
Packaged Terminal Air Conditioners and Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	May 13, 2013 ...	AHRI 310/380–2004.

[1] Incorporated by reference, see § 431.95.

(2) On or after the compliance dates listed in Table 2 of this section, determine the energy efficiency of each type of covered equipment by conducting the test procedure(s) listed in the rightmost column of Table 2 of this section along with any additional testing provisions set forth in paragraphs (c), (d), and (e) of this section, that apply to the energy efficiency descriptor for that equipment, category, and cooling capacity. Note, the omitted sections of the test procedures listed in the rightmost column of Table 1 of this section shall not be used.

TABLE 2 TO § 431.96—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Compliance with test procedure required on or after	Use tests, conditions, and procedures [1] in
Small Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled, 3-Phase, AC and HP.	<65,000 Btu/h	SEER and HSPF	May 13, 2013 ...	AHRI 210/240–2008 (omit section 6.5). AHRI 340/360–2007 (omit section 6.3).
	Air-Cooled AC and HP.	≥65,000 Btu/h and <135,000 Btu/h.	EER and COP	May 13, 2013 ...	
	Water-Cooled and Evaporatively-Cooled AC.	<65,000 Btu/h	EER	May 13, 2013 ...	AHRI 210/240–2008 (omit section 6.5). AHRI 340/360–2007 (omit section 6.3).
		≥65,000 Btu/h and <135,000 Btu/h.	EER	May 13, 2013 ...	
	Water-Source HP	<135,000 Btu/h	EER and COP	May 13, 2013 ...	ISO Standard 13256–1 (1998).
Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥135,000 Btu/h and <240,000 Btu/h.	EER and COP	May 13, 2013 ...	AHRI 340/360–2007 (omit section 6.3). AHRI 340/360–2007 (omit section 6.3).
	Water-Cooled and Evaporatively-Cooled AC.	≥135,000 Btu/h and <240,000 Btu/h.	EER	May 13, 2013 ...	
Very Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥240,000 Btu/h and <760,000 Btu/h.	EER and COP	May 13, 2013 ...	AHRI 340/360–2007 (omit section 6.3). AHRI 340/360–2007 (omit section 6.3).
	Water-Cooled and Evaporatively-Cooled AC.	≥240,000 Btu/h and <760,000 Btu/h.	EER	May 13, 2013 ...	
Packaged Terminal Air Conditioners and Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	May 13, 2013 ...	AHRI 310/380–2004 (omit section 5.6).
Computer Room Air Conditioners.	AC	<65,000 Btu/h	SCOP	October 29, 2012.	ASHRAE 127–2007 (omit section 5.11). ASHRAE 127–2007 (omit section 5.11).
		<65,000 Btu/h and <760,000 Btu/h.	SCOP	May 13, 2013 ...	
Variable Refrigerant Flow Multi-split Systems.	AC	<760,000 Btu/h	EER and COP	May 13, 2013 ...	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).
Variable Refrigerant Flow Multi-split Systems, Air-cooled.	HP	<760,000 Btu/h	EER and COP	May 13, 2013 ...	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).

TABLE 2 TO § 431.96—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS—Continued

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Compliance with test procedure required on or after	Use tests, conditions, and procedures [1] in
Variable Refrigerant Flow Multi-split Systems, Water-source.	HP	<17,000 Btu/h	EER and COP	October 29, 2012.	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).
Variable Refrigerant Flow Multi-split Systems, Water-source.	HP	≥17,000 Btu/h and <760,000 Btu/h.	EER and COP	May 13, 2013	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	July 16, 2012	AHRI 390–2003 (omit section 6.4).

[1] Incorporated by reference, see § 431.95.

(c) *Optional break-in period for tests conducted using AHRI 210/240–2008, AHRI 340/360–2007, AHRI 390–2003, AHRI 1230–2010, and ASHRAE 127–2007.* Manufacturers may optionally specify a ''break-in'' period, not to exceed 20 hours, to operate the equipment under test prior to conducting the test method specified by AHRI 210/240–2008, AHRI 340/360–2007, AHRI 390–2003, AHRI 1230–2010, or ASHRAE 127–2007 (incorporated by reference, see § 431.95). A manufacturer who elects to use an optional compressor break-in period in its certification testing should record this information (including the duration) in the test data underlying the certified ratings that is required to be maintained under 10 CFR 429.71.

(d) *Refrigerant line length corrections for tests conducted using AHRI 1230–2010.* For test setups where it is physically impossible for the laboratory to use the required line length listed in Table 3 of the AHRI 1230–2010 (incorporated by reference, see § 431.95), then the actual refrigerant line length used by the laboratory may exceed the required length and the following correction factors are applied:

Piping length beyond minimum, X (ft)	Piping length beyond minimum, Y (m)	Cooling capacity correction %
0>X ≤20	0>Y ≤6.1	1
20>X ≤40	6.1>Y ≤12.2	2
40>X ≤60	12.2>Y ≤18.3	3
60>X ≤80	18.3>Y ≤24.4	4
80>X ≤100	24.4>Y ≤30.5	5
100 >X ≤120	30.5>Y ≤36.6	6

(e) *Additional provisions for equipment set-up.* The only additional specifications that may be used in setting up the basic model for test are those set forth in the installation and operation manual shipped with the unit. Each unit should be set up for test in accordance with the manufacturer installation and operation manuals. Paragraphs (e)(1) through (3) of this section provide specifications for addressing key information typically found in the installation and operation manuals.

(1) If a manufacturer specifies a range of superheat, sub-cooling, and/or refrigerant pressure in its installation and operation manual for a given basic model, any value(s) within that range may be used to determine refrigerant charge or mass of refrigerant, unless the manufacturer clearly specifies a rating value in its installation and operation manual, in which case the specified rating value shall be used.

(2) The air flow rate used for testing must be that set forth in the installation and operation manuals being shipped to the commercial customer with the basic model and clearly identified as that used to generate the DOE performance ratings. If a rated air flow value for testing is not clearly identified, a value of 400 standard cubic feet per minute (scfm) per ton shall be used.

(3) For VRF systems, the test set-up and the fixed compressor speeds (*i.e.*, the maximum, minimum, and any intermediate speeds used for testing) should be recorded and maintained as

part of the test data underlying the certified ratings that is required to be maintained under 10 CFR 429.71.

(f) *Manufacturer involvement in assessment or enforcement testing for variable refrigerant flow systems.* A manufacturer's representative will be allowed to witness assessment and/or enforcement testing for VRF systems. The manufacturer's representative will be allowed to inspect and discuss set-up only with a DOE representative and adjust only the modulating components during testing in the presence of a DOE representative that are necessary to achieve steady-state operation. Only previously documented specifications for set-up as specified under paragraphs (d) and (e) of this section will be used.

[77 FR 28989, May 16, 2012]

ENERGY EFFICIENCY STANDARDS

§ 431.97 Energy efficiency standards and their compliance dates.

(a) All basic models of commercial package air-conditioning and heating equipment must be tested for performance using the applicable DOE test procedure in § 431.96, be compliant with the applicable standards set forth in paragraphs (b) through (f) of this section, and be certified to the Department under 10 CFR part 429.

(b) Each commercial air conditioner or heat pump (not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, and variable refrigerant flow systems) manufactured on and after the compliance date listed in the corresponding table must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1, 2, and 3 of this section.

TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY STANDARDS FOR AIR-CONDITIONING AND HEATING EQUIPMENT

[Not including single package vertical air conditioners and single package vertical heat pumps, packaged terminal air conditioners and packaged terminal heat pumps, computer room air conditioners, and variable refrigerant flow multi-split air conditioners and heat pumps]

Equipment type	Cooling capacity	Sub-category	Heating type	Efficiency level	Compliance date: products manufactured on and after . . .
Small Commercial Packaged Air-Conditioning and Heating Equipment (Air-Cooled, 3 Phase)	<65,000 Btu/h	AC	All	SEER = 13	June 16, 2008.
		HP	All	SEER = 13	June 16, 2008.
Small Commercial Packaged Air-Conditioning and Heating Equipment (Air-Cooled)	≥65,000 Btu/h and <135,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 11.2	January 1, 2010.
			All Other Types of Heating.	EER = 11.0	January 1, 2010.
		HP	No Heating or Electric Resistance Heating.	EER = 11.0	January 1, 2010.
			All Other Types of Heating.	EER = 10.8	January 1, 2010.
Large Commercial Packaged Air-Conditioning and Heating Equipment (Air-Cooled)	≥135,000 Btu/h and <240,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 11.0	January 1, 2010.
			All Other Types of Heating.	EER = 10.8	January 1, 2010.
Heating Equipment (Air-Cooled).	>240,000 Btu/h	HP	No Heating or Electric Resistance heating.	EER = 10.6	January 1, 2010.
			All Other Types of Heating.	EER = 10.4	January 1, 2010.
Very Large Commercial Packaged Air-Conditioning and Heating Equipment (Air-Cooled)	≥240,000 Btu/h and <760,000 Btu/h.	AC	No Heating or Electric Resistance Heating.	EER = 10.0	January 1, 2010.
			All Other Types of Heating.	EER = 9.8 ...	January 1, 2010.
		HP	No Heating or Electric Resistance Heating.	EER = 9.5 ...	January 1, 2010.
		.....	All Other Types of Heating.	EER = 9.3 ...	January 1, 2010.